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## **2008 SMALL GAME HARVEST SURVEY**

Brian J. Frawley

### **Abstract**

*A survey was completed to estimate the number of people hunting small game, their days afield, and harvest during the 2008-2009 hunting seasons. The survey also was used to investigate hunter satisfaction, compliance with the Harvest Information Program (HIP), and to estimate proportion of hunters using dogs. In 2008, 273,243 people purchased small game hunting licenses, a decrease of about 7% from 2007. An estimated 184,474 people actually hunted small game species in 2008, which was unchanged from 2007. Small game hunters most often sought ruffed grouse, squirrels, and cottontail rabbits. The number of small game hunters did not change significantly between 2008 and 2007 for all species except for rabbit hunters. Significantly fewer hunters statewide pursued rabbits (-9%) in 2008 than during 2007. Hunting effort and harvest statewide did not change significantly for any species between 2007 and 2008. Compared to 2007, a similar proportion of small game hunters in 2008 were satisfied with their overall small game hunting experience (65% versus 66% satisfied). Moreover, similar proportions of small game hunters were satisfied with the amount of small game seen (45% for both years) and small game harvested (35% versus 36%). In 2008, 90% of migratory bird hunters registered with HIP. About 96% of the waterfowl hunters and 84% of the woodcock hunters had registered with HIP. About 41% of active small game hunters used dogs during 2008. Highest use of dogs occurred among hunters pursuing woodcock (60%) and pheasant (58%).*



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## INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. This responsibility is shared with the U.S. Fish and Wildlife Service (USFWS) for managing migratory species such as woodcock (*Scolopax minor*), ducks (Anatinae), and geese (*Branta* and *Anser* spp.). Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimates derived from harvest surveys, as other indices of abundance, are used to monitor game populations and help establish harvest regulations.

Since the 1950s, the primary small game species harvested in Michigan have been ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American woodcock, cottontail rabbit (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), squirrels (*Sciurus* spp. and *Tamiasciurus hudsonicus*), and American crow (*Corvus brachyrhynchos*) (Frawley 2008). Most of these animals could be harvested during fall and early winter (Table 1) by a person possessing a small game hunting license (includes resident, nonresident, 3-day nonresident, resident junior, and senior small game hunting licenses). Coyotes (*Canis latrans*) could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). Coyotes also may be taken without a license on private property by a property owner or their designee if they are doing or about to do damage on their property. Woodcock hunters were required to register with the National Migratory Bird Harvest Information Program (HIP). Landowners and their families that hunted small game on their property where they resided could hunt without a hunting license, although they still needed to register with HIP if they hunted migratory game birds.

The HIP is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about harvest of migratory game birds. Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with HIP and answer several questions about their hunting experience during the previous year. The HIP provided the USFWS with a national registry of migratory bird hunters from which they can select participants for harvest surveys.

Estimating harvest, hunter numbers, and hunting effort were the primary objectives of the small game harvest survey. This survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to investigate hunter satisfaction with the 2008 hunting season and small game numbers. Small game hunters were also asked whether they hunted with dogs and which species they hunted with dogs.

## METHODS

The Wildlife Division provided all small game hunters the option to report information voluntarily about their hunting activity via the internet. This option was advertised on the DNR website and an email message was sent to small game hunting license buyers that had provided an email address to the DNR. Hunters reported species hunted, county hunted,

type of land on which hunt occurred (public or private lands), number of days spent afield, and number of animals harvested. In addition, hunters were asked whether they had hunted waterfowl and to rate their overall hunting experience and indicate their satisfaction with the amount of game seen and amount harvested, and number of days in the hunting season. Hunters were also asked whether they hunted small game using a dog and which species they pursued. Following the 2008 hunting seasons, a questionnaire was sent to 9,987 randomly selected people that were eligible to hunt small game and had not already voluntarily reported harvest information via the Internet. Hunters receiving the questionnaire in the mail were asked the same questions as hunters responding on the internet.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups (strata) based on their county of residence and whether they had voluntarily reported their hunting activity on the internet. Residents of the Upper Peninsula (UP), Northern Lower Peninsula (NLP), Southern Lower Peninsula (SLP), and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). Another stratum consisted of hunters that had voluntarily reported their hunting activity on the internet before the sample for the mail survey was selected. The overall sample consisted of 1,386 people from the UP stratum (N= 31,383), 3,064 people from the NLP stratum (N= 63,535), 8,639 from the SLP stratum (N= 163,937), and 575 people from the nonresident and unknown residency stratum (N=10,923). In addition, 3,483 people that had responded voluntarily via the internet were part of the final sample. Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each group matched the proportion its members contributed to the statewide population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). The DNR sells hunting licenses using a statewide automated license sales system. This system allowed the DNR to maintain a central database containing license sales information (e.g., sales transactions) for each license buyer. Using the license sales database, small game hunting license buyers that also purchased a fur harvesters license were identified, and then coyote harvest was estimated separately for small game licensees with and without a fur harvesters license. The license sales database also was used to identify whether small game hunting licensees had registered with HIP. Using this information, estimates of compliance with HIP among small game hunting license buyers hunting migratory species (woodcock) was estimated.

Estimates were derived separately for the UP, NLP, and SLP (Figure 1). Hunting effort and animals harvested from unknown locations were allocated among areas in proportion to the effort and harvest estimated from known locations.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or sampling error, varies depending on the particular sample selected, and this variability was measured by the

95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the population, the inability to obtain data from all units in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals) and by unlicensed landowners and their family that legally hunted on their own land.

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ( $P < 0.005$ ), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially in mid-May. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 242 people, primarily because of changes in residence. Questionnaires were returned by 5,532 people, yielding a 57% adjusted response rate. In addition, 3,483 people voluntarily reported information about their hunting activity via the Internet before the random sample was selected.

## **RESULTS AND DISCUSSION**

### **License sales and hunter participation**

In 2008, 277,215 people purchased small game hunting licenses, a decrease of about 7% from 2007 (Table 2). About  $68 \pm 1\%$  of the licensees actually hunted in 2008 (Tables 2 and 3), which was higher than estimated in 2007 (64%). An estimated 184,474 people actually hunted small game species in 2008 (excluded people hunting waterfowl only), an insignificant decrease of about 2% from 2007 (Table 3). About 96% of the active small game hunters were males (Table 3). Hunters most often sought ruffed grouse, squirrels, and cottontail rabbits (Table 4). In 2008, the average age of small game license buyers was 45 years (Figure 2). Nearly 12% (32,202) of the license buyers were younger than 17 years old.

### **Harvest and hunting trends**

The number of small game hunters did not change significantly between 2008 and 2007 for all species except for rabbit hunters. Significantly fewer hunters statewide pursued rabbits

(-9%) in 2008 than during 2007 (Table 4). Hunting effort and harvest statewide did not change significantly for any species between 2007 and 2008 (Tables 5 and 6).

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). In 2008, an estimated 31,289 small game hunters pursued coyotes (Tables 4 and 7). About 77% of these hunters possessed only a small game hunting license (Table 7), and they were responsible for 63% of the coyotes taken by all small game license holders.

The number of small game hunters in Michigan has declined about 70% since the mid-1950s and is currently at a record low (Figure 3). This trend has been previously reported in Michigan and nationally (Brown et al. 2000, Enck et al. 2000, Frawley 2006, U.S. Department of the Interior 2008). Hawn (1979) speculated declining ring-necked pheasant populations was the primary reason for declining small game hunter numbers in Michigan. The number of people hunting pheasants has declined by about 90% between the mid-1950s and recent years (Figure 4). Many other factors have contributed to the decline of small game hunting, including increased urbanization of the human population, increased competition between hunting and other leisure activities, and loss of wildlife habitat (Brown et al. 2000).

Declining small game hunting participation since the mid-1950s also has been noted among hunters pursuing cottontail rabbits (-80%), snowshoe hare (-75%), and squirrels (-60%, Figure 4). Changes in hunter participation and harvest were generally similar.

Hunter numbers in the 1970s through the early 1980s were likely affected by the initiation and subsequent elimination of the put-take pheasant program (Figure 5). This program was created for the purpose of providing additional pheasant hunting opportunities. Each year while the program existed, pen-raised pheasants were released on several state properties in southern Michigan (Janson 1975, Janson and Anderson 1976).

Changes in the harvest of game species and hunter participation often track changes in game populations. The number of hunters that pursued pheasants, rabbits, snowshoe hares, and squirrels was at record low levels during recent years (Figure 4). Game population surveys have indicated pheasant, quail, and woodcock populations are currently among their lowest recorded levels since the 1960s (Frawley and Stewart 2008, Cooper and Parker 2009). The abundance of rabbit, hare, and squirrels was not monitored annually; thus, it was not possible to determine whether harvest and population trends were similar. Michigan's grouse population generally follows a cyclic pattern lasting about 10 years, and the grouse population in 2008 appeared to be increasing after reaching the low in the present cycle during 2004-2005 (Frawley and Stewart 2009). Hunter numbers and the number of grouse harvested have followed a similar cyclic pattern. The decline in crow hunters and their hunting effort in Michigan may reflect declining crow numbers as a result of the recent emergence of West Nile virus in North America (LaDeau et al. 2007).

Although many small game species are not as abundant today as during previous decades (e.g., pheasant, quail, woodcock), the mean number of animals taken per hunting effort has

not paralleled changes in the population (Figure 6). For example, hunting efficiency has been high among hunters despite declining numbers of pheasant and woodcock.

About 33% of the small game hunters in Michigan hunted on private lands only, 21% hunted on public lands only, and 39% hunted on both private and public lands (Table 8). Private lands served as the primary area for hunters pursuing pheasants, quail, cottontail rabbits, crows, and coyotes (Tables 8 and 9), while public lands were most popular among hunters pursuing grouse, woodcock, and snowshoe hares.

### **Hunter satisfaction**

Compared to 2007 (Frawley 2008), a similar proportion of small game hunters in 2008 were satisfied with their overall small game hunting experience (65% in 2008 versus 66% satisfied in 2007) (Table 10). Moreover, similar proportions of small game hunters were satisfied with the amount of small game seen (45% both years) and small game harvested (35% versus 36%).

### **Migratory bird hunters and Harvest Information Program (HIP) compliance**

An estimated  $83,790 \pm 3,207$  small game hunters hunted migratory birds (waterfowl and woodcock combined) in Michigan during 2008, compared to  $80,770 \pm 3,355$  in 2007. An estimated  $52,098 \pm 2,750$  hunters pursued waterfowl, and  $41,052 \pm 2,477$  hunters pursued woodcock in 2008. The number of waterfowl and woodcock hunters combined in 2008 was not statistically different from 2007.

Frawley (2011) estimated  $47,384 \pm 1,035$  waterfowl hunters in Michigan during 2008 from the waterfowl harvest survey. In contrast, this current survey estimated  $52,098 \pm 2,750$  people hunted waterfowl. The previous estimate was obtained from a separate survey sent to a random sample of waterfowl license buyers and HIP registrants younger than 17 years old. The estimate from this small game harvest survey included a larger population of hunters, including many hunters that were not licensed to hunt waterfowl. This difference may partly account for the difference between the two estimates; however, differences also result from sampling and nonsampling errors (see Methods).

In 2008,  $90 \pm 1\%$  of migratory bird hunters had registered with HIP. About  $96 \pm 1\%$  of the waterfowl hunters and  $84 \pm 2\%$  of the woodcock hunters had registered with HIP. Compliance among hunters was unchanged from the rate of compliance in 2007 (Frawley 2008). Hunters registered with HIP were responsible for about 92% of the woodcock taken and 85% of the woodcock hunting trips done in 2008 (Table 11). Waterfowl hunters were not asked to report their harvest and hunting effort; thus, it was not possible to estimate harvest and effort for waterfowl among HIP registrants.

Cooper and Parker (2009) reported estimates of harvest, hunter numbers, and hunting effort of Michigan woodcock hunters in 2008 from a USFWS survey. These estimates were based on responses received from a random sample of HIP registrants. Cooper and Parker estimated  $34,600 \pm 4,500$  hunters went afield  $156,000 \pm 26,500$  days and harvested

78,900  $\pm$  13,400 woodcock. These estimates were less than estimates from the present survey (Tables 4-6). Because nearly 15% of Michigan woodcock hunters failed to register with HIP, the estimates derived from the USFWS survey would be expected to be lower than estimates from the present survey. Estimates of hunter numbers derived from a subset of Michigan hunters that had registered with HIP (Table 11) was not significantly different from estimates from the USFWS survey; however, harvest and hunting effort estimates in this survey were significantly greater than estimated by the USFWS survey. This difference may reflect unknown differences in the way the surveys were implemented.

The USFWS conducted a survey of HIP registrants and estimated 46,900  $\pm$  4,200 people hunted waterfowl in Michigan in 2008 (Raftovich et. al. 2010). The estimated number of waterfowl hunters derived from the current survey (52,098) was not significantly different from the USFWS estimate.

An estimated 3,058  $\pm$  742 youth hunters (10-15 years old) participated during the 2-day youth waterfowl hunting season. About 13  $\pm$  3% of the youth hunters eligible to hunt during the youth season actually participated. An estimated 13  $\pm$  2% of adult (at least 18 years old) waterfowl hunters in 2010 (5,941  $\pm$  1,023) accompanied at least one youth during the 2-day youth waterfowl hunting season. (More than one adult could report hunting with the same youth; thus, the estimated number of adults hunting with a youth was greater than the number of youth hunting during the youth season.)

Frawley (2011) estimated 2,755  $\pm$  434 youth hunters hunted during the 2-day youth waterfowl hunting season in 2008, and 5,979  $\pm$  613 adult waterfowl hunters accompanied at least one youth during this youth waterfowl hunting season. Estimates from this current survey did not differ from the estimates from the waterfowl harvest survey.

### **Hunting with dogs**

About 41  $\pm$  2% of active small game hunters used dogs during 2008. Highest use of dogs occurred among hunters pursuing woodcock (60  $\pm$  3%) and pheasant (58  $\pm$  3%). Dogs were also frequently used by hunters hunting grouse (41  $\pm$  2%), snowshoe hare (37  $\pm$  5%), quail (35  $\pm$  20%), and rabbit (34  $\pm$  2%). Only 14  $\pm$  3% of coyote hunters used dogs to hunt coyote.

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Table 1. Small game hunting seasons in Michigan, 2008-2009.

Species, season, and area <sup>a</sup>	Season dates
Ring-necked pheasant	
Upper Peninsula (Zone 1)	Oct. 10 – 31
Lower Peninsula (Zone 2)	Oct. 20 – Nov. 14
Lower Peninsula (Zone 3)	Oct. 20 – Nov. 14 and Dec. 1 – Jan. 1
Northern bobwhite quail	
Southern Lower Peninsula	Oct. 20 – Nov. 14
Ruffed grouse	
Statewide	Sept. 15 – Nov. 14 and Dec. 1 – Jan. 1
American woodcock	
Statewide	Sept. 20 – Nov. 3
Cottontail rabbit	
Statewide	Sept. 15 – March 31
Snowshoe hare	
Statewide	Sept. 15 – March 31
Squirrels	
Statewide	Sept. 15 – March 1
American crow	
Upper Peninsula	Aug. 1 – Sept. 30
Lower Peninsula	Aug. 1 – Sept. 30 and Feb. 1 – March 31
Coyote	
Zones 1 and 2	July 15 – Nov. 14 and Dec. 1 – April 15
Zone 3	July 15 – April 15

<sup>a</sup>See Figure 1 for boundaries of hunt areas.

Table 2. Number of small game hunting licenses sold in Michigan, 2004-2008.

Item	Year					2007-2008 % Change
	2004	2005	2006	2007	2008	
Number of licenses sold <sup>a</sup>	311,002	291,948	300,099	298,685	277,215	-7
Number of people buying a hunting license <sup>b</sup>	306,526	287,562	295,369	293,662	273,243	-7

<sup>a</sup>The number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.

<sup>b</sup>A person was counted only once, regardless of how many licenses they purchased.

Table 3. Estimated sex and age of active small game hunters in Michigan, 2004-2008.<sup>a</sup>

Variable	2004	2005	2006	2007	2008	
					Estimate	95% CL
Hunters <sup>b</sup>	210,455	196,501	207,981	188,297	184,474	3,281
Males (%)	97.1	96.9	97.1	95.9	96.4	0.6
Females (%)	2.9	3.1	2.9	3.7	3.6	0.6
Age (Years) <sup>c</sup>	42.0	43.3	43.2	43.8	44.7	0.5

<sup>a</sup>Analyses included only those people that hunted.

<sup>b</sup>People that hunted American crow, American woodcock, cottontail rabbit, coyote, northern bobwhite quail, ring-necked pheasant, ruffed grouse, snowshoe hare, or squirrels. Coyote hunters were not included in estimate of small game hunters prior to the 2007 estimate.

<sup>c</sup>Mean age of active hunters on October 1.

\*Non-overlapping 95% confidence intervals indicated estimates differed significantly between the last two years ( $P < 0.005$ ).

Table 4. Estimated number of small game hunters by species and region in Michigan, 2005-2008.<sup>a</sup>

Species and region	2005	2006	2007	2008		2007-08 % Change
				No.	95% CL	
Ring-necked pheasant <sup>b</sup>						
UP	1,352	3,004	2,019	2,378	637	18
NLP	21,386	19,691	16,331	15,290	1,536	-6
SLP	36,014	36,964	30,218	27,795	2,059	-8
Statewide	55,590	56,192	45,669	43,144	2,553	-6
Northern bobwhite quail						
NLP	649	256	279	4	1	-99*
SLP	2,964	2,462	1,455	1,052	386	-28
Statewide	3,264	2,718	1,578	1,056	437	-33
Ruffed grouse						
UP	35,516	38,221	38,677	39,356	1,897	2
NLP	51,082	47,647	45,127	46,730	2,490	4
SLP	13,658	14,199	11,138	11,200	1,361	1
Statewide	92,428	92,698	88,727	91,417	3,065	3
American woodcock						
UP	12,286	11,544	9,695	11,068	1,321	14
NLP	27,158	23,254	24,418	26,154	1,977	7
SLP	7,715	8,014	6,875	7,271	1,106	6
Statewide	43,286	39,618	37,875	41,052	2,477	8
Cottontail rabbit						
UP	4,869	3,941	4,158	3,976	813	-4
NLP	30,476	28,247	22,682	23,309	1,796	3
SLP	62,725	64,005	59,602	52,642	2,574	-12*
Statewide	91,525	89,703	82,647	75,455	3,086	-9*
Snowshoe hare						
UP	11,392	10,243	8,911	7,726	1,084	-13
NLP	11,033	11,976	6,739	7,678	1,094	14
SLP	1,554	2,322	1,412	1,599	525	13
Statewide	23,277	23,566	16,593	16,507	1,643	-1
Squirrels						
UP	5,210	4,305	6,329	5,596	949	-12
NLP	38,602	41,965	32,967	33,009	2,083	0
SLP	53,288	58,476	48,435	47,771	2,496	-1
Statewide	90,324	98,373	83,487	81,736	3,177	-2
American crows						
UP	1,293	1,283	1,079	1,177	446	9
NLP	7,471	4,582	4,859	4,336	830	-11
SLP	10,858	8,558	7,924	6,746	1,063	-15
Statewide	19,021	13,699	13,379	11,812	1,426	-12
Coyote						
UP	NA	4,557	3,168	3,875	798	22
NLP	NA	14,709	12,563	12,783	1,391	2
SLP	NA	16,794	16,627	16,718	1,640	1
Statewide	NA	33,182	30,369	31,289	2,231	3

<sup>a</sup>The number of hunters does not add up to the statewide total because hunters can hunt in more than one region.<sup>b</sup>Included both regular and late pheasant hunting seasons.\*Non-overlapping 95% confidence intervals indicated estimates differed significantly ( $P < 0.005$ ).

Table 5. Estimated amount of small game hunter effort (days afield) by species and region, 2004-2008.

Species and region	2005	2006	2007	2008		2007-08 % Change
				No.	95% CL	
Ring-necked pheasant <sup>a</sup>						
UP	6,956	17,728	11,024	13,411	5,168	22
NLP	87,349	73,670	57,056	58,064	9,674	2
SLP	170,933	149,123	109,096	108,718	15,060	0
Statewide	265,238	240,521	177,176	180,193	18,974	2
Northern bobwhite quail						
NLP	3,658	970	2,048	7	1	-100*
SLP	9,466	8,172	3,663	3,422	2,239	-7
Statewide	13,124	9,142	5,711	3,428	2,258	-40
Ruffed grouse						
UP	298,039	273,177	335,400	325,116	32,314	-3
NLP	291,457	302,392	238,393	244,730	23,658	3
SLP	63,366	72,545	72,843	54,329	12,815	-25
Statewide	652,861	648,114	646,636	624,175	42,476	-3
American woodcock						
UP	76,952	60,543	70,993	58,633	11,439	-17
NLP	146,969	139,342	121,955	144,577	19,521	19
SLP	36,886	38,933	26,290	36,142	10,011	37
Statewide	260,807	238,819	219,238	239,352	25,643	9
Cottontail rabbit						
UP	37,053	20,713	31,356	22,994	7,686	-27
NLP	176,525	146,278	103,912	122,123	18,041	18
SLP	408,930	457,310	364,908	306,463	33,097	-16
Statewide	622,508	624,301	500,176	451,580	40,085	-10
Snowshoe hare						
UP	86,254	51,238	77,972	49,280	19,439	-37
NLP	53,472	72,704	37,577	41,400	11,024	10
SLP	7,776	12,828	6,861	9,881	7,535	44
Statewide	147,502	136,769	122,409	100,561	24,576	-18
Squirrels						
UP	31,883	47,745	56,052	39,009	11,289	-30
NLP	217,342	324,200	171,061	168,707	20,138	-1
SLP	321,882	357,930	323,983	297,621	34,511	-8
Statewide	571,106	729,875	551,097	505,337	43,514	-8
American crow						
UP	8,581	4,574	6,477	5,938	3,665	-8
NLP	28,820	13,388	31,143	20,098	7,383	-35
SLP	42,323	30,139	37,229	32,444	11,796	-13
Statewide	79,724	48,101	74,850	58,480	16,385	-22
Coyote						
UP	NA	131,284	20,885	19,053	9,599	-9
NLP	NA	66,657	86,395	90,332	21,375	5
SLP	NA	118,940	121,267	112,024	29,724	-8
Statewide	NA	316,881	228,547	221,409	38,550	-3

<sup>a</sup>Included both regular and late pheasant hunting seasons.

\*Non-overlapping 95% confidence intervals indicated estimates differed significantly ( $P < 0.005$ ).

Table 6. Estimated small game harvest by species and region in Michigan, 2005-2008.

Species and region	2005	2006	2007	2008		2007-08 % Change
				No.	95% CL	
Ring-necked pheasant <sup>a</sup>						
UP	2,111	7,841	3,765	4,796	2,062	27
NLP	35,560	29,214	22,317	25,528	5,519	14
SLP	56,346	57,703	39,736	32,598	5,180	-18
Statewide	94,017	94,758	65,817	62,922	8,090	-4
Northern bobwhite quail						
NLP	577	0	74	2	1	-97
SLP	2,980	3,212	1,511	853	1,098	-44
Statewide	3,557	3,212	1,585	854	1,098	-46
Ruffed grouse						
UP	105,564	154,473	193,227	183,804	19,484	-5
NLP	94,109	101,793	100,163	106,329	12,700	6
SLP	15,625	14,568	9,667	10,858	3,246	12
Statewide	215,298	270,834	303,057	300,990	23,686	-1
American woodcock						
UP	37,743	40,167	31,623	28,699	7,599	-9
NLP	67,168	70,748	72,233	79,190	12,626	10
SLP	16,525	23,221	8,983	13,801	4,756	54
Statewide	121,437	134,136	112,838	121,690	17,050	8
Cottontail rabbit						
UP	9,206	7,438	8,248	7,818	2,941	-5
NLP	76,337	74,707	58,268	79,068	14,699	36
SLP	334,276	358,970	299,430	269,207	30,614	-10
Statewide	419,820	441,116	365,946	356,093	36,603	-3
Snowshoe hare						
UP	28,339	44,258	29,937	30,892	2,637	3
NLP	14,904	15,570	9,530	10,419	4,470	9
SLP	2,790	5,955	2,892	4,491	12,297	55
Statewide	46,033	65,783	42,360	45,802	14,657	8
Squirrels						
UP	32,352	38,012	65,161	39,965	12,297	-39
NLP	195,545	311,378	176,428	196,157	23,932	11
SLP	285,000	359,526	265,225	304,433	31,847	15
Statewide	512,898	708,917	506,814	540,555	42,480	7
American crow						
UP	6,271	4,258	7,038	9,178	9,377	30
NLP	46,955	39,827	37,688	30,032	15,336	-20
SLP	55,839	28,240	35,350	22,471	10,018	-36
Statewide	109,066	72,325	80,076	61,681	21,739	-23
Coyote						
UP	NA	3,869	4,530	2,888	1,534	-36
NLP	NA	9,762	17,567	19,531	7,123	11
SLP	NA	19,599	14,387	17,035	5,751	18
Statewide	NA	33,231	36,485	39,454	10,172	8

<sup>a</sup>Included both regular and late pheasant hunting seasons.\*Non-overlapping 95% confidence intervals indicated estimates differed significantly ( $P < 0.005$ ).

Table 7. Estimated number of coyote hunters, coyotes harvested, and hunting effort (days afield) by small game hunters with and without a fur harvesters license in Michigan, 2008.<sup>a</sup>

Small game hunter group	Hunters		Days afield		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
Without fur harvesters license	24,196	1,995	157,074	33,354	24,838	7,422
With fur harvesters license	7,092	1,109	64,334	19,702	14,616	7,004
Combined	31,289	2,231	221,409	38,550	39,454	10,172

<sup>a</sup>Coyotes can also be taken by hunters possessing either a small game hunting or a fur harvesters license. These estimates do not include people with only a fur harvesters license that hunted coyotes.

Table 8. Estimated number and proportion of hunters hunting on private and public lands during the 2008 small game hunting season, summarized by species.

Species	Land type															
	Private land only				Public land only				Both private and public lands				Unknown land			
	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL
Ring-necked pheasant	26,044	2,056	60	3	6,690	1,089	16	2	8,391	1,213	19	3	2,019	609	5	1
Northern bobwhite quail	555	318	53	21	205	193	19	16	250	213	24	18	46	89	4	8
Ruffed grouse	17,122	1,687	19	2	36,263	2,340	40	2	32,669	2,156	36	2	5,362	982	6	1
American woodcock	6,046	1,028	15	2	19,342	1,772	47	3	11,840	1,424	29	3	3,824	828	9	2
Cottontail rabbit	40,426	2,467	54	2	11,112	1,387	15	2	20,490	1,853	27	2	3,427	790	5	1
Snowshoe hare	3,447	782	21	4	5,757	998	35	5	5,946	1,016	36	5	1,357	496	8	3
Squirrels	36,712	2,385	45	2	19,290	1,793	24	2	21,061	1,875	26	2	4,673	918	6	1
American crow	6,431	1,062	54	6	1,613	537	14	4	2,700	695	23	5	1,068	441	9	4
Coyote	18,843	1,778	60	4	3,608	800	12	2	7,196	1,123	23	3	1,642 12,09	545	5	2
Combined	60,393	2,902	33	1	39,548	2,449	21	1	72,437	3,059	39	2	6	1,457	7	1



Table 9. Estimated number of days of hunting effort on private and public lands during the 2008 small game hunting season in Michigan, summarized by species.<sup>a</sup>

Species	Land type							
	Private lands		Public lands		Both private and public lands		Unknown	
	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL
Ring-necked pheasant	100,719	13,626	29,962	7,338	42,361	9,415	7,150	2,959
Northern bobwhite quail	2,629	2,080	181	290	619	831	0	0
Ruffed grouse	91,234	13,472	260,669	27,101	237,154	29,895	35,118	12,914
American woodcock	31,734	9,422	122,775	18,977	65,644	12,634	19,200	5,816
Cottontail rabbit	221,069	26,001	73,267	14,390	137,735	24,563	19,509	7,958
Snowshoe hare	12,874	4,252	34,210	11,728	43,836	18,961	9,640	5,723
Squirrels	207,871	26,035	129,289	21,175	141,961	24,235	26,216	8,406
American crow	26,343	7,670	9,200	5,731	15,671	8,972	7,265	4,246
Coyote	97,633	18,169	31,574	14,288	69,238	21,157	22,964	14,600

<sup>a</sup>People that hunted small game on both private and public lands were not asked to record the amount of effort separately for each land type; thus, it was not possible to estimate the total amount or proportion of effort devoted to either private or public lands separately.

Table 10. Level of satisfaction among active small game hunters (% of hunters) with the 2008 small game hunting season in Michigan.<sup>a</sup>

Index used to measure season satisfaction	Level of satisfaction									
	Very satisfied		Somewhat satisfied		Neutral		Somewhat dissatisfied		Very dissatisfied	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Small game seen	15	1	30	1	21	1	21	1	13	1
Small game harvested	11	1	25	1	27	1	21	1	17	1
Length of season	32	2	28	1	28	1	7	1	4	1
Overall experience	29	1	36	2	20	1	10	1	5	1

<sup>a</sup>Analyses limited to small game license buyers that actually hunted in 2008 and indicated a level of satisfaction.

Table 11. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2008.<sup>a</sup>

Variable	No.	95% CL
Hunters	34,559	2,299
Days afield (effort)	203,704	23,702
Harvest	111,667	16,624

<sup>a</sup>Analyses limited to people that registered with HIP and hunted woodcock.

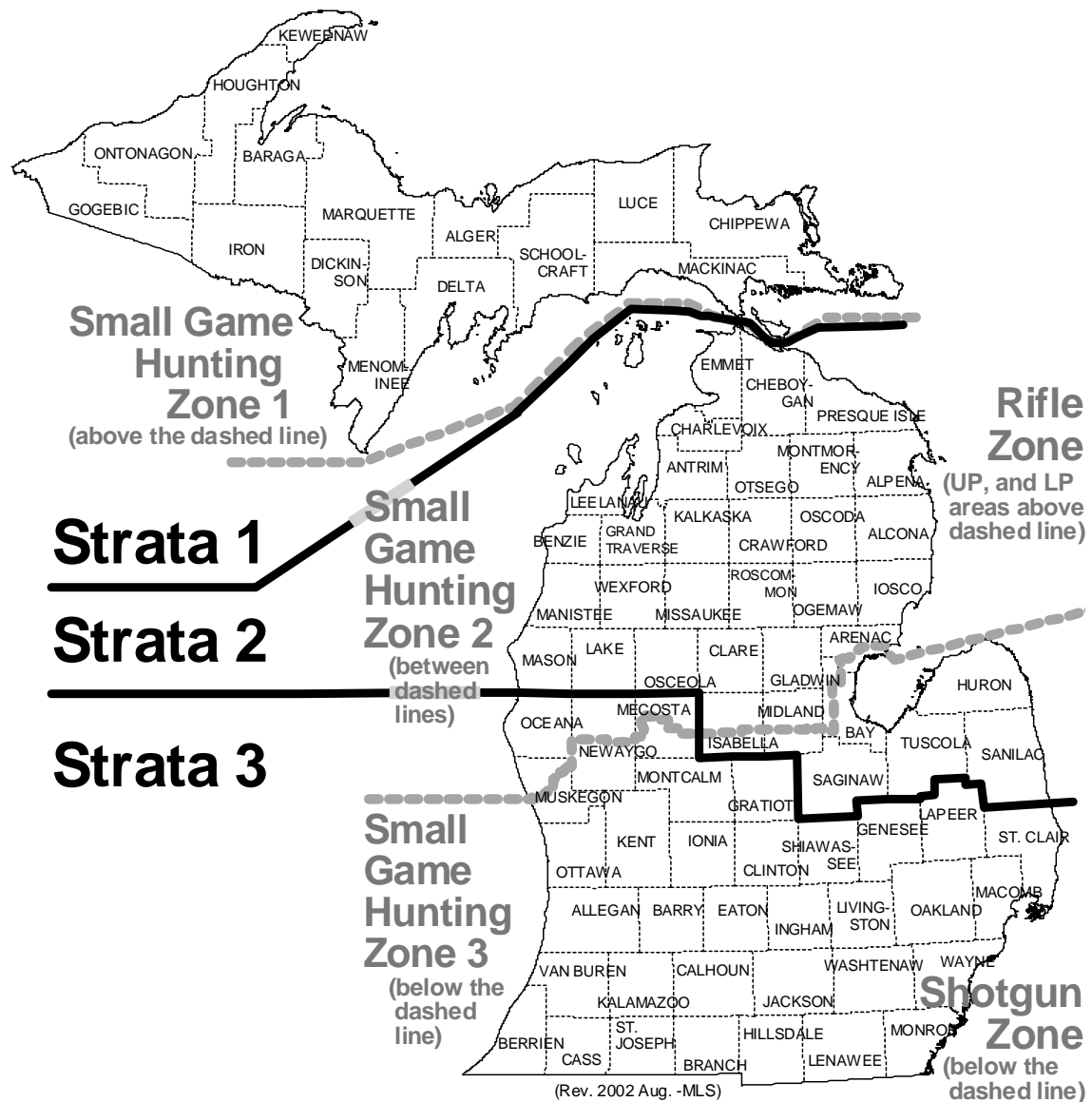


Figure 1. Areas (strata) used to summarize the survey data (top). Stratum boundaries did not match the small game management hunting zones.

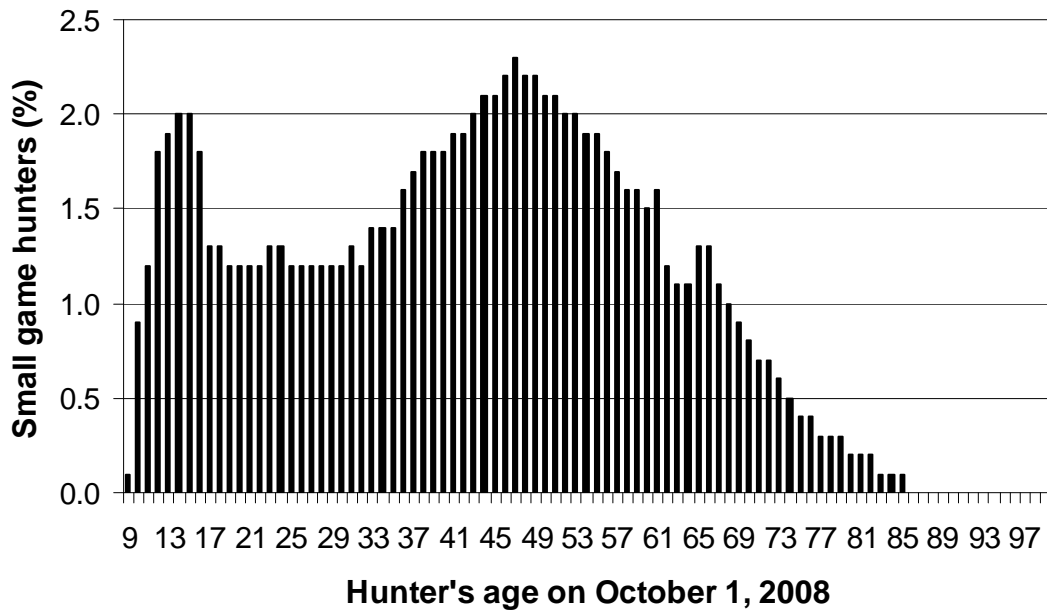


Figure 2. Age of people that purchased a small game hunting license in Michigan for the 2008 hunting seasons ( $\bar{x}$  = 42 years).

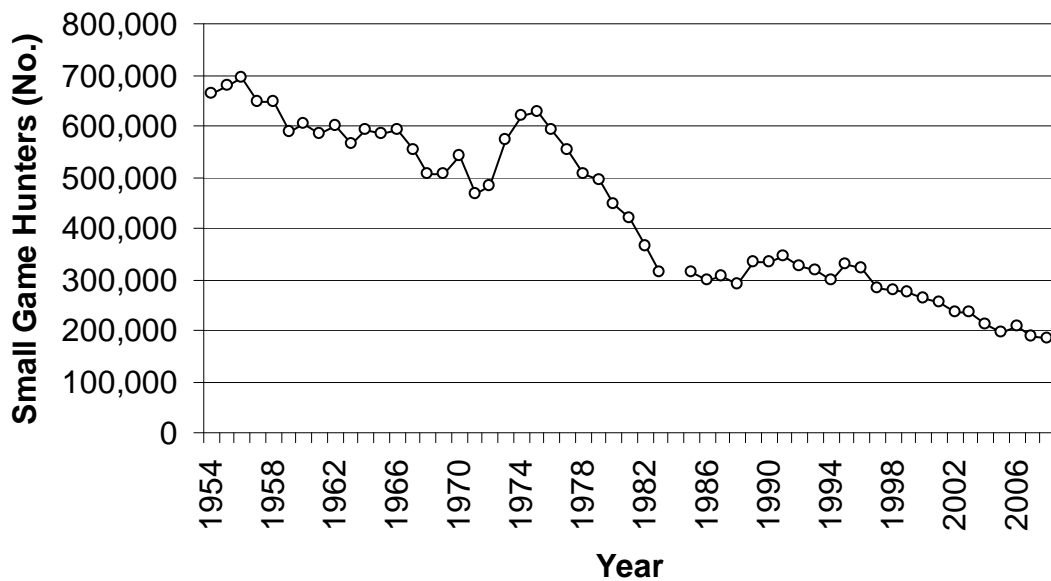


Figure 3. Estimated number of small game hunters in Michigan, 1954-2008 (estimate of the number of people that went afield). No estimate was available for 1984.

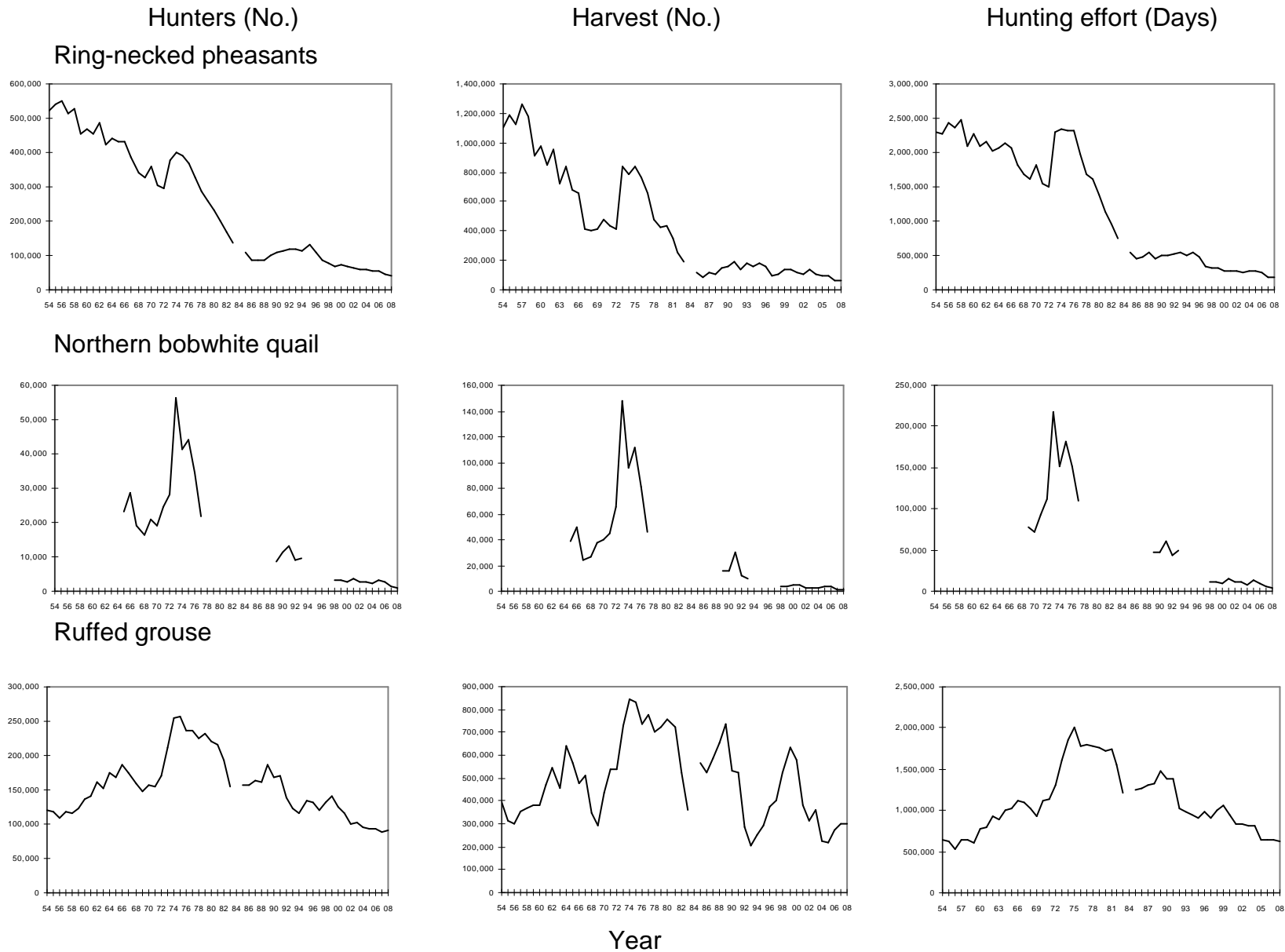


Figure 4. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2008. No estimates were available or no seasons existed during years when no data are plotted.

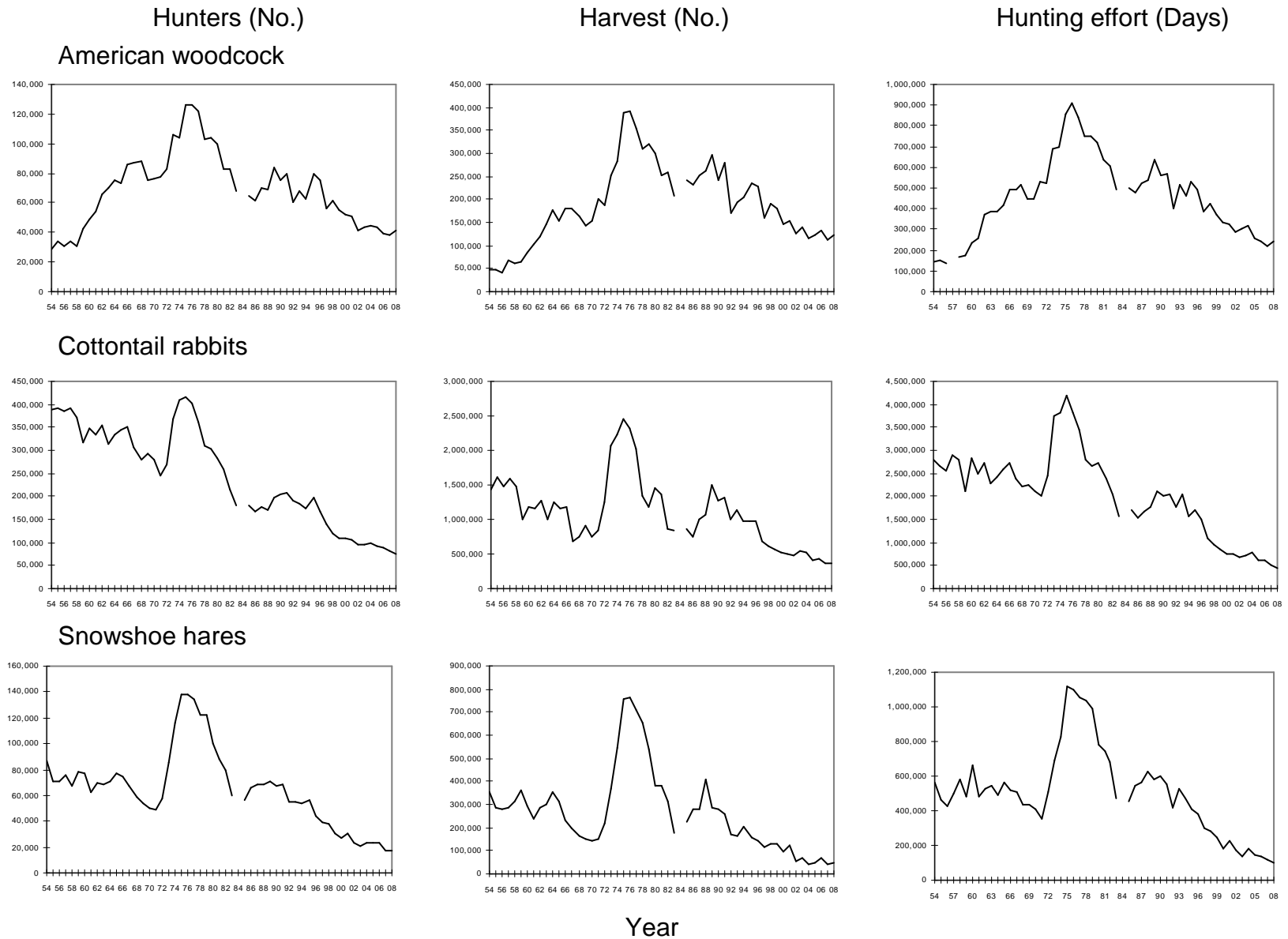


Figure 4 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2008. No estimates were available or no seasons existed during years when no data are plotted.

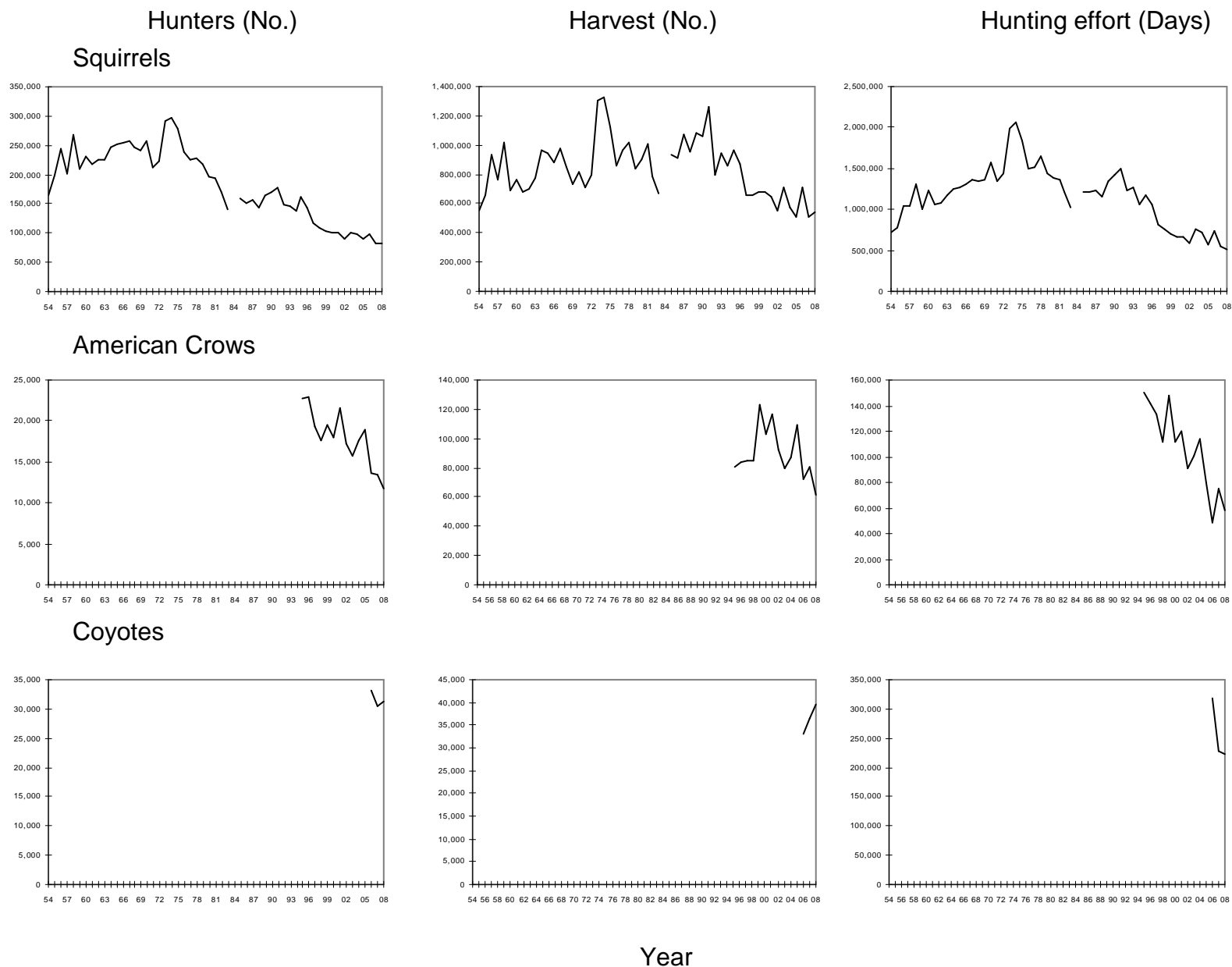


Figure 4. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2008. No estimates were available or no seasons existed during years when no data are plotted.



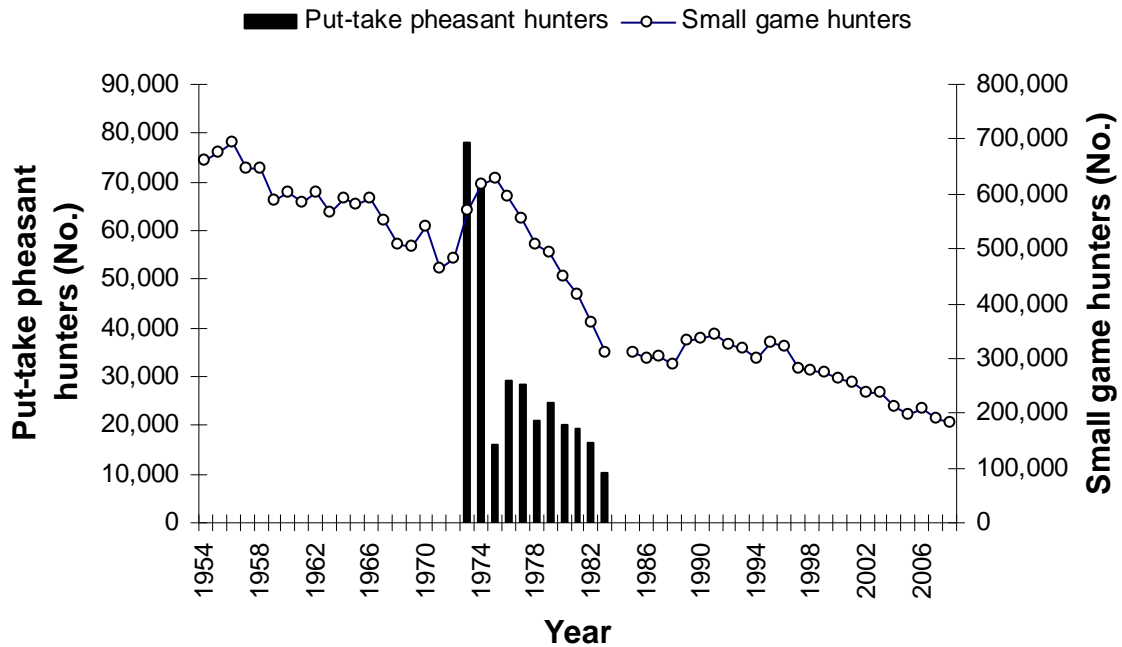
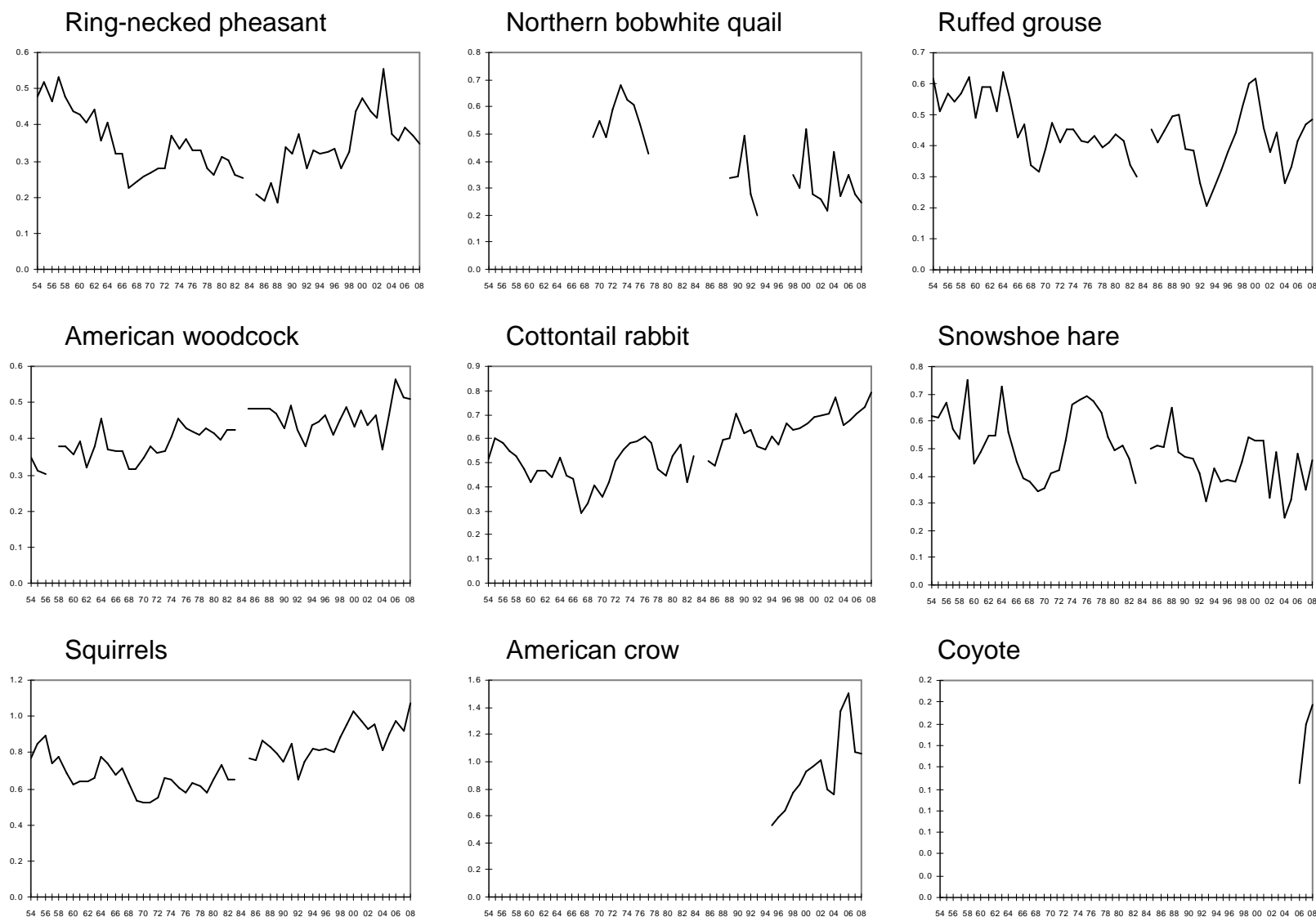


Figure 5. Estimated number of small game hunters in Michigan, 1954-2008 (estimate of the number of people that went afield) and number of people participating in put-take pheasant hunts (1973-1983). The numbers of put-take pheasant hunters were estimated for 1973-1974 (Janson 1975, Janson and Anderson 1976), while numbers of hunters during 1975-1983 were tallies of annual put-take permits sold (DNR, unpublished data). Thus, the estimates of put-take hunters during 1973-1975 and 1976-1983 periods are not directly comparable. No estimates of small game hunters or put-take pheasant hunters were available for 1984.



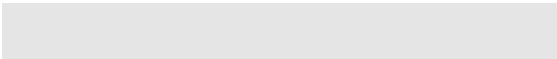
Year

Figure 6. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2008. No estimates were available or no seasons existed during years when no data are plotted.



2008-2009 UPLAND GAME HARVEST REPORT

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.



*It is important that you complete and return this questionnaire even if you did not hunt or harvest any animals. Report only **your** hunting activities and the animals that **you** harvested. Do not report any game taken on a licensed shooting preserve.*

1. Did you attempt to hunt upland small game species in Michigan during 2008-09?

- <sup>1</sup> ☐ Yes. Please complete the table below.  
<sup>2</sup> ☐ No. Skip to Question #2.

SPECIES (Check box if you hunted during the season.)	COUNTY HUNTED (List the counties hunted on separate lines.)	NUMBER OF DAYS HUNTED (Include all days hunted, even if you did not harvest anything.)	TYPE OF LAND	NUMBER OF ANIMALS TAKEN
<sup>0</sup> <input checked="" type="checkbox"/> Example	<sup>1</sup> Jackson	5	<sup>1</sup> <input checked="" type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	12
<sup>1</sup> <input type="checkbox"/> Pheasant	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>2</sup> <input type="checkbox"/> Ruffed Grouse	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>3</sup> <input type="checkbox"/> Woodcock	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>4</sup> <input type="checkbox"/> Cottontail Rabbit	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>5</sup> <input type="checkbox"/> Snowshoe Hare	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>6</sup> <input type="checkbox"/> Squirrel	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>7</sup> <input type="checkbox"/> Crow	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>8</sup> <input type="checkbox"/> Quail (Portions of the Southern Lower Peninsula)	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
<sup>9</sup> <input type="checkbox"/> Coyote	1		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	2		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	3		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	
	4		<sup>1</sup> <input type="checkbox"/> Private <sup>2</sup> <input type="checkbox"/> Public <sup>3</sup> <input type="checkbox"/> Both	

Questions continued on back

2. Did you attempt to hunt ducks or geese in Michigan during 2008-09?

1

☐

Yes

2

☐

No (skip to question #5)
3. If you are a youth, did you hunt waterfowl during Michigan’s Youth Waterfowl Hunting weekend (September 20-21, 2008)?

1

☐

Yes

2

☐

No
4. If you are an adult, did you take a youth hunting during Michigan’s Youth Waterfowl Hunting weekend (September 20-21, 2008)?

1

☐

Yes

2

☐

No

5. During the last upland small game hunting season, how satisfied or dissatisfied were you with:	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
a. The amount of small game seen.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
b. Number of small game harvested.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
c. Number of days in the hunting season.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
d. Your overall hunting experience.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

6. Did you hunt upland small game species using dogs during the 2008-09 season?

1

☐

Yes

2

☐

No (Skip Question #5)
7. If you used dogs to hunt small game during the 2008-09 season, please indicate which species you hunted with dogs. (Check all that apply.)

1

☐

Pheasant

2

☐

Ruffed Grouse

3

☐

Woodcock

4

☐

Cottontail Rabbit

5

☐

Snowshoe Hare

6

☐

Squirrel

7

☐

Crow

8

☐

Quail

9

☐

Coyote

*Please return questionnaire in the enclosed postage-paid envelope.  
Thank you for your help!*

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